REMARKS

Claims 1 and 5-11, as presented in Applicant's September 12, 2007 communication to the U.S. Patent and Trademark Office, are pending in the subject application, with claim 1 being in independent form. Claims 2-4 and 12-22 were previously cancelled without disclaimer or prejudice.

By this Amendment, independent claims 1 and 7-11 have been amended, and claims 5 and 6 have been cancelled without disclaimer or prejudice to Applicant's right to pursue the subject matter of these claims in the future. Following entry of this Amendment, claims 1 and 7-11 will be pending, with claim 1 being in independent form.

Applicant respectfully submits that no new matter has been introduced by this Amendment. Support for the amendments to the claims can be found in the original disclosure at, for example, pages 18 and 19 of the specification.

Entry of this Amendment is respectfully requested.

Rejection of Claims 1 and 5-11 Under 35 U.S.C. §103

In the November 2, 2009 Office Action, the Examiner rejected claims 1 and 5-11 as allegedly unpatentable under 35 U.S.C. §103(a). The Examiner rejected claim 1 as allegedly unpatentable over U.S. Patent No. 5,630,837 to Crowley (hereinafter "Crowley") in view of U.S. Patent No. 6,245,020 to Moore et al. (hereinafter "Moore"). The Examiner rejected claims 5-11 as allegedly unpatentable over Crowley in view of Moore and U.S. Patent No. 6,117,101 to Diederich et al. (hereinafter "Diederich").

By this Amendment, independent claim 1 has been amended to recite, in clean form:

> Apparatus for use with a subject, comprising:
> a catheter having a longitudinal axis and having a distal portion;

an ultrasound array arranged to the distal portion of the catheter, the ultrasound array comprising a plurality of ultrasound transducers, the plurality of ultrasound transducers being circumferentially arranged around the longitudinal axis and on a plane orthogonal to the longitudinal axis, and adapted to operate in a phased array mode to apply ablating energy to tissue of the subject located in a range of azimuths, with respect to the longitudinal axis, that is less than 360 degrees;

a detection functionality adapted to determine a portion of the tissue of the subject that is not to be targeted by the ablating energy and a next successive portion of the tissue of the subject to be ablated; and

a controlling functionality adapted to control the ultrasound array to set the range of azimuths responsive to the determination of the portion of the tissue that is not to be targeted and the next successive portion of the tissue of the subject to be ablated as determined by the detection functionality.

Amended independent claim 1 is patentably distinguishable over the teachings of the cited references for at least the following reasons.

Crowley, as presently understood by Applicant, describes a catheter system 500 including an array 502 of annular acoustic elements 504-514 for tissue ablation. Each annular acoustic element is described as including a transducer ring 526. Crowley states that the annular configuration of the transducer ring 526 allows a physician to create 360° (i.e., ring-shaped) lesions without rotation of the catheter. See Crowley, column 3, line 48 to column 4, line 14. Crowley also describes a reflecting shield 612 for radially reflecting and re-directing acoustic energy generated by array 502. See Crowley, column 7, lines 21-40.

It is the Examiner's position that annular acoustic elements 504-514 can be considered to be circumferentially arranged along the longitudinal axis of catheter system 500.

Applicant respectfully disagrees with the Examiner. However, in order to expedite prosecution, Applicant has herein amended independent claim 1 to further clarify that the claimed apparatus comprises "an ultrasound array arranged to the distal portion of the catheter, the ultrasound array comprising a plurality of ultrasound transducers, the plurality of

ultrasound transducers being circumferentially arranged around the longitudinal axis and on a plane orthogonal to the longitudinal axis, and adapted to operate in a phased array mode to apply ablating energy to tissue of the subject located in a range of azimuths, with respect to the longitudinal axis, that is less than 360 degrees".

Acoustic elements 504-514 of array 502 in Crowley are not circumferentially arranged around the longitudinal axis of catheter system 500 and on a plane orthogonal to the longitudinal axis of catheter system 500. Accordingly, Crowley fails to disclose or suggest the "ultrasound array" as set forth in amended independent claim 1.

In Crowley, each transducer ring 526 is operated to create ring-shaped lesions. Reflecting shield 612 can also be operated to reflect and re-direct acoustic energy generated by each transducer ring 526. Crowley, however, is silent as to determining a portion of a tissue of the subject that is not to be targeted by ablating energy and a next successive portion of the tissue of the subject to be ablated, and controlling an ultrasound array to set the range of azimuths responsive to the determination of the portion of the tissue that is not to be targeted and the next successive portion of the tissue of the subject to be ablated as determined by the detection functionality. Accordingly, Crowley also fails to disclose or suggest the "detection functionality" and "controlling functionality" as set forth in amended independent claim 1.

Moore, as presently understood by Applicant, describes a catheter 230 for ultrasonic imaging of a vessel wall. The catheter 230 includes a catheter body 232 and a plurality of transducer elements 234 embedded in the distal end of the catheter body 232 and circumferentially arranged therearound to form a phased array.

In the November 2, 2009 Office Action, the Examiner cited Moore as allegedly disclosing use of a phased array comprising 32 or more transducers. Moore, however, fails to disclose or suggest the above-described deficiencies of Crowley.

Diederich, as presently understood by Applicant, describes an ablation device for forming a circumferential conduction block in a pulmonary vein. Diederich was cited by the Examiner as allegedly teaching the use of annular transducers to deliver ultrasound energy to specific azimuth ranges.

Diederich, at column 32, lines 62 and 63, describes operating a transducer 830 to vary the degree of heating in the angular dimension. However, Diederich fails to disclose or suggest first determining a portion of a tissue of the subject that is not to be targeted by the ablating energy and a next successive portion of the tissue of the subject to be ablated, and then controlling the ultrasound array to set the range of azimuths responsive to the determination of the portion of the tissue that is not to be targeted and the next successive portion of the tissue of the subject to be ablated as determined by the detection functionality. Accordingly, Diederich, like Crowley and Moore, fails to disclose or suggest the "detection functionality" and "controlling functionality" as set forth in amended independent claim 1.

Based on the above, Applicant respectfully submits that the cited references, taken alone or in combination, fail to teach or suggest the apparatus set forth in amended independent claim 1. Accordingly, amended independent claim 1 is patentable over the cited references.

Claims 7-11 have been amended to depend from and include all of the limitations of independent claim 1. Accordingly, claims 7-11 are patentable over the cited references for at least the reasons set forth above with respect to independent claim 1.

Claims 5 and 6 have been cancelled thereby rendering the Examiner's rejection of claims 5 and 6 under 35 U.S.C. §103(a) moot.

Withdrawal of the Examiner's rejection of claims 1 and 5-11 under 35 U.S.C. §103(a) is respectfully requested.

Conclusion

In view of the above, it is respectfully submitted that the subject application is in condition for allowance. Accordingly, it is respectfully requested that the subject application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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